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TITLE: ⑤ Niobium extraction with tributylphosphate (TBP)

SOURCE: ⑦ Akademiya nauk Kazakhskoy SSR. Institut metallurgii i obogashcheniya. Trudy. v. 5, 1962, Tsvetnaya metallurgiya, 119 - 124

TEXT: Graphoanalytical and physico-chemical methods of measuring the electric conductivity of the organic phase were employed to investigate complex formation in systems $\text{HF-Nb}_2\text{O}_5\text{-TBP}$ and $\text{HF-H}_2\text{SO}_4\text{-Nb}_2\text{O}_5\text{-TBP}$. The authors studied niobium extraction depending on the concentration of hydrofluoric acid, on the metal concentration in the solution, and on tributylphosphate concentration in the extrahent. At relatively low Nb concentrations in the initial solution the composition of the complex to be extracted was determined in three series of experiments using solutions with different concentrations of hydrofluoric and sulfuric acids, and equal Nb content. The experimental investigation yielded the following results. It was established that in the presence of 3 mole sulfuric acid in the aqueous solution, the extremal niobium concentration in undiluted

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tributylphosphate is 1 mole/l or 133 g/l Nb_2O_5 . In the absence of sulfuric acid in the aqueous solution, the extremal Nb content in the extrahent can only attain 0.74 mole (98 g/l Nb_2O_5). Out of hydrofluoric acid solutions, with and without sulfuric acid, niobium is extracted with tributylphosphate in the form of a trisolvate ($\text{HNbF}_6 \cdot 3\text{TBP}$). From niobium-saturated solutions with a solid phase, niobium is transferred to the ester phase in the form of oxifluoride complexes $\text{H}_2\text{NbOF}_5 \cdot 3\text{TBP}$, $\text{HNbOF}_4 \cdot 3\text{TBP}$. There are 2 tables and 3 figures.

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